

Utah Patient Safety Update



PATIENT SAFETY

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"[Our] success will be indicated initially by seeing an increased number of events detected and reported across the state."

Scott D. Williams, MD
Deputy Director,
Utah Department of Health

Utah Rule Provides First Year of Patient Safety Data

A first-year summary of Utah's patient safety initiative was released in December by the Utah Department of Health (UDOH), Utah Hospitals and Health Systems Association (UHA), and HealthInsight. The UDOH's patient safety rules that took effect October 1, 2001, require hospitals and outpatient surgical centers to report adverse medical and drug events and to have programs to improve patient safety.

Utah is one of 20 states that require medical error reporting. "We see these rules as an important tool that allows Utah hospitals to share information in order to better identify problems and create solutions," said Rick Kinnersley, President, UHA.

"Medical errors happen in all healthcare settings and also at home," says Scott Williams, M.D., UDOH Deputy Director. "Medicine is complex and systems aren't always designed to minimize errors. But we now have a structured way to identify them, evaluate them, and try to learn from each event in order to prevent as many as we can."

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Patient Safety Sentinel Event Reporting Rule

The Utah Hospitals and Health Systems Association (UHA), jointly with the Utah Medical Association (UMA) and Utah Department of Health (UDOH), established a patient safety task force in 2000. This task force initiated the discussion of and endorsed the administrative rules on patient safety that went into effect on October 1, 2001.

The Patient Safety Event Reporting Rule requires that:

- (1) Each facility shall report to the Department all patient safety sentinel events.
- (2) The incident facility shall report the patient safety sentinel event to the Department within seventy-two hours of the facility's determination, but in no event later than four hours prior to convening a formal root cause analysis.
- (3) The incident facility shall establish a root cause analysis process and designate a responsible individual to be the facility lead for each patient safety sentinel event.

The complete text of the Patient Safety Sentinel Event Reporting Rule can be viewed online at <http://www.rules.utah.gov/publicat/code/r380/r380-200.htm>.

The three organizations expect that with better awareness, recognition, documentation, and tracking, the rates of adverse events will initially increase for the first few years as data continues to be collected. "This doesn't mean that the incidence of errors will actually be going up - it means that they are now being reported and we have a system for improvement," says Williams. "By reporting these events we can begin to identify ways to eliminate errors and further improve delivery of care." Aggregate data analyzed at a state level helps identify trends that can benefit all facilities.

An adverse event is defined as an injury resulting from a medical intervention - either an act of care or the omission of necessary care - rather than from the patients' underlying disease process. There are two kinds of adverse events that are currently reported under the Utah rules: adverse drug events (ADEs) and sentinel events.

Sentinel Events

Definition: A reportable sentinel event includes surgery on the wrong patient or the wrong body part, suicide of a patient, alleged assaults, or major loss of physical or mental function or death that is directly related to medical care provided to a patient and is not an expected outcome of the patient's underlying condition. UDOH's new reporting rule requires community hospitals; specialty hospitals, such as orthopedic and psychiatric hospitals; and ambulatory surgical centers to report all sentinel events by telephone and by written form. Following each sentinel event, facilities are required to conduct an internal "root cause analysis" to learn why the event occurred. An action plan is then submitted to UDOH outlining ways that the hospital or surgical center plans to prevent similar errors in the future through interventions such as staff education, closer staff supervision, process changes and better tracking procedures.

Results Reported to UDOH: Among nearly 450,000 inpatient hospital and outpatient surgical center discharges, 34 sentinel events were reported by 76 facilities during the one-year reporting period since the rule took effect. The 34 sentinel events (18 Male/16 Female) include 18 deaths, 10 individuals losing mental or physical function, five wrong-site or wrong-patient surgeries, and one patient

suicide not related to clinical service. The medical/surgical units were the most common location of events in hospitals with 13 occurring there (see Figure 1). Next were the intensive care unit and operating room with seven each, and the remaining seven cases occurred in other facility settings.

At this time there is no national standard of reporting to provide a reference as to how these 34 sentinel cases compare to the rest of the U.S. Previous research, however, suggests that Utah's rate of serious sentinel events may be lower than other areas of the country. In other public health surveillance programs in Utah, such as influenza case monitoring, the number of identified cases often increase initially as tracking systems improve.

The oft quoted Institute of Medicine report "To Err is Human" estimates that there are 44,000-98,000 deaths due to errors annually in the U.S. The lower estimate of 44,000 deaths/year was derived in part from Utah data, and Utah accounts for 0.74% of the total U.S. hospital discharges of 33.6 million in 1997. Utah would therefore be expected to have 327 deaths/year (0.74% of 44,000) related to medical errors using the IOM methodology. This is nearly 20 times Utah's reported number of 18 sentinel event deaths in 2002. This discrepancy demands that we focus on both improving our sentinel event reporting and taking a closer look at the methodology that informed the IOM's conclusions.

Utah's new patient safety reporting system now provides an opportunity for providers to work collaboratively and find solutions to these complex issues. In an effort to refine the reporting system, UHA has formed two "user groups" consisting of hospital, public health, and quality improvement representatives- one for sentinel events, and one for adverse drug events. The ADE group is developing a standard tool for hospitals to improve detection of ADEs, and the sentinel event group is working to improve root cause analysis processes across the state.

"Utah's hospitals work very hard to provide quality patient care in their communities," commented Kinnersley. "The vast majority of patients treated in our hospitals have successful outcomes and an improved quality of life. As in any large complicated system, however, errors do occur occasionally, and Utah's hospitals are committed to making their facilities as safe as possible."

About Misadventures and Other Specified Procedure Complications

Definitions: For the Utah patient safety project, an adverse event (AE) is defined as an undesirable and unintended injury resulting from a medical intervention (an act of care provided by the hospital or by the omission of necessary care), rather than from the patient's underlying disease process.

A misadventure or other specified procedure complication (misadventure) is an adverse event where the harm is clearly due to medical intervention. For instance, causes of injury such as foreign object left in the body, mechanical failure of instruments or apparatus, and failure of sterile precautions are clear examples of unintended injuries due to errors in medical management of the patients.

Classification: Misadventures were detected in the Utah Hospital Discharge Database using a classification scheme validated by the project's expert panel for the ICD-9-CM Classification of Adverse Events. The scheme designates a set of 66 ICD-9-CM codes (including diagnosis codes and E-codes) as misadventure codes (Adverse Events Related to Medical Care, Utah: 1995-1999, June, 2001).

Grouping: These 66 ICD-9-CM codes are grouped into seven classes of similar codes (see Table 1).

Table 1 shows the number of inpatient hospital discharges that include at least one misadventure or other specified procedure complication for the years 1999, 2000, and 2001. Over 90% of these events are accidental punctures or lacerations, as shown in Table 1 and Figure 1.

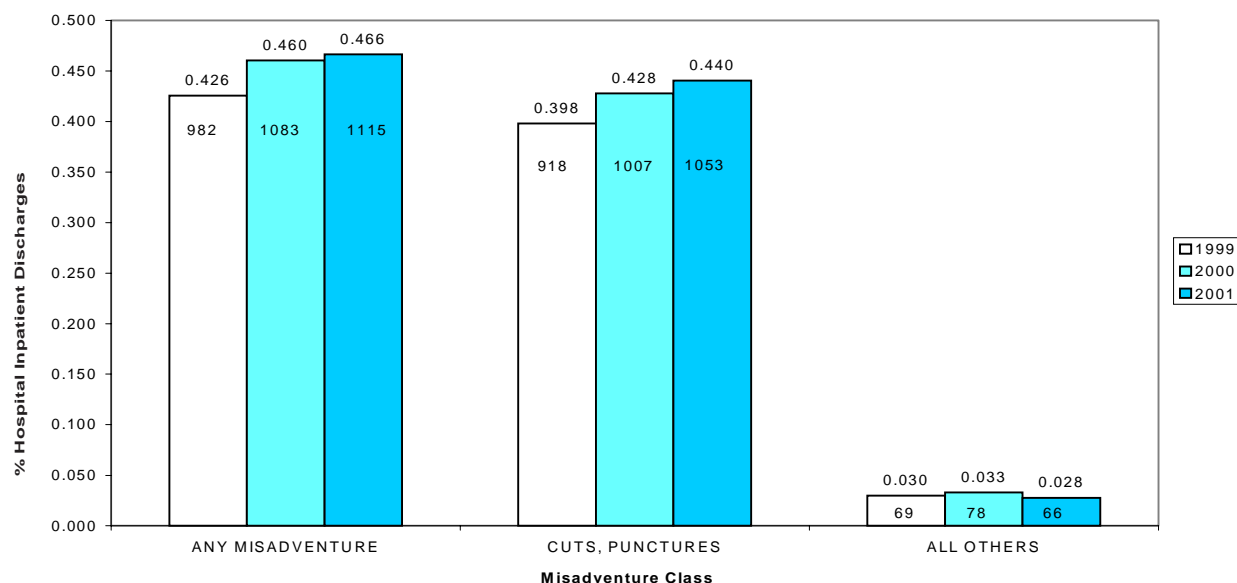
| TABLE 1 Numbers of Hospital Discharges by Year and by ICD-9-CM Misadventure Class Utah Acute Care Hospital Inpatient Discharges, 1999-2001 Secondary Diagnoses | | | |
|---|------------------------------|-------------|-------------|
| | Number of Discharges* | | |
| Medical Misadventure or Other Specified Complication | 1999 | 2000 | 2001 |
| All medical misadventures | 982 | 1,083 | 1,115 |
| 1 998.2, E870.0-E870.9 Accidental puncture or laceration | 918 | 1,007 | 1,053 |
| 2 998.4, 998.7, E871.0-E871.9 Foreign body accidentally left in body | 21 | 26 | 20 |
| 3 E872.0-E872.9 Failure of sterile precautions | 1 | 1 | 0 |
| 4 E873.0-E873.9 Excessive amount, wrong dosage, radiation | 0 | 3 | 2 |
| 5 E874.0-E874.9 Mechanical failure | 6 | 5 | 5 |
| 6 E875.0-E875.9 Contaminated substance | 3 | 1 | 1 |
| 7 E876.0-E876.9 Wrong fluid, surgical site, trach tube position, other | 37 | 42 | 38 |
| Total Discharges for the Year | 230,694 | 235,284 | 239,051 |
| | Percentages** | | |
| Medical Misadventure or Other Specified Complication | 1999 | 2000 | 2001 |
| All medical misadventures | 0.4257 | 0.4603 | 0.4661 |
| 1 998.2, E870.0-E870.9 Accidental puncture or laceration | 0.3979 | 0.428 | 0.4402 |
| 2 998.4, 998.7, E871.0-E871.9 Foreign body accidentally left in body | 0.0091 | 0.0111 | 0.0084 |
| 3 E872.0-E872.9 Failure of sterile precautions | 0.0004 | 0.0004 | 0 |
| 4 E873.0-E873.9 Excessive amount, wrong dosage, radiation | 0 | 0.0013 | 0.0008 |
| 5 E874.0-E874.9 Mechanical failure | 0.0026 | 0.002 | 0.0021 |
| 6 E875.0-E875.9 Contaminated substance | 0.0013 | 0.0004 | 0.0004 |
| 7 E876.0-E876.9 Wrong fluid, surgical site, trach tube position, other | 0.016 | 0.0179 | 0.0159 |
| Total Discharges for the Year | 230,694 | 235,284 | 239,051 |

Source: Utah Hospital Discharge Database, 1999-2001. Utah Department of Health

Numbers of Discharges* = discharges that include at least one potential misadventure or specified complication.

Percentages** uses the total discharges for the year as the denominator.

Figure 1: Percentages of Utah Acute Care Hospital Inpatient Discharges with at Least One Misadventure, 1999 - 2001, Secondary Diagnoses



About ICD-9-CM Codes

The International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM) has as two of its major code types diagnosis codes and E-codes. The former set of codes describe the nature of the patient's diagnosis whereas the latter set describes the possible external cause of the injury, where appropriate. If a laceration occurred during a procedure, the diagnosis code would address the laceration (e.g., 998.2, Accidental puncture or laceration during procedure), while the E-code could describe in more detail the procedure that was the external cause (e.g., E870.0, Accidental laceration during surgery). While diagnosis codes play a critical role in determining how much a provider is paid for a service, E-codes are not directly related to reimbursement. There is little financial incentive for E-code reporting at this time. Therefore, misadventures identified by E-codes probably are under recorded.

Limitations of using the Administrative Data and the ICD-9-CM Classification for Detecting Misadventures

- Unable to separate the events that occurred prior to current hospitalization from those that occurred during hospitalization
- Unable to categorize degree of harm
- Unable to capture near misses
- Unable to perform reliable inter-institutional comparisons due to coding variation among facilities

About the Data

The Utah Hospital Discharge Database has nine fields for reporting ICD-9-CM diagnosis codes. Since 1995, reporting of the principal E-code has been required.

Utah's Hospital Discharge Data System contains patient-level information about all hospitalizations that occur in all of Utah's licensed hospitals. The Utah Health Data Committee, through its staff in the Utah Department of Health, collects the data under the authority of the Utah Health Data Authority Act.

During the year 2001, 239,218 total discharges were reported by 41 Utah acute care hospitals. Information about each hospitalization includes patient characteristics, diagnosis codes, procedure codes, payer information, etc.

For this update analysis was restricted to hospitalizations in 41 acute care hospitals, excluding specialty hospitals such as rehabilitation and psychiatric hospitals.

Misadventures and Other Specified Procedure Complications: Cuts and Punctures

As most of these events are accidental punctures or lacerations, figures 2A, 2B, and 2C provide more detail about these events for years 1999-2001.

There are two different code types that can be used for an accidental cut or puncture: the diagnosis code 998.2 and the external cause of injury codes E870.0-E870.9. The diagnosis code does not provide information as to the cause of injury, while the E-codes specify causes such as surgical operation, infusion/transfusion, etc. An event could be coded solely with diagnosis code 998.2, with diagnosis code 998.2 and an E870 code, or by an E870 code without the diagnosis code 998.2 (in this case the E870 code would be associated with another diagnosis code).

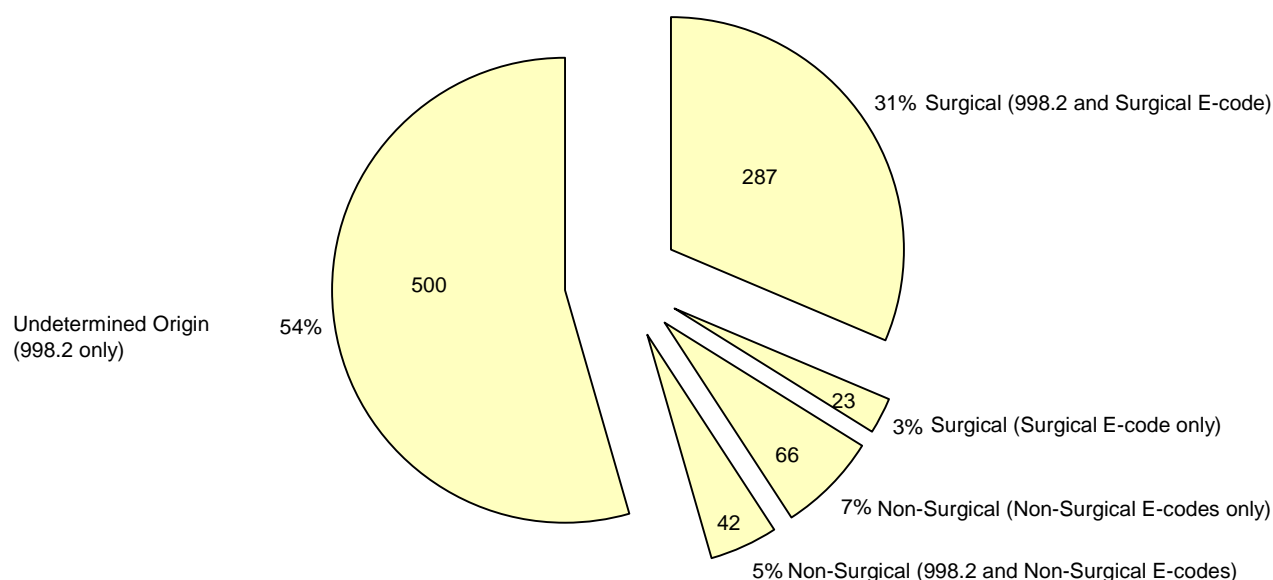
The figures break down these events into the following mutually exclusive subgroups:

- Surgical (diagnosis code and surgical E-code)
- Surgical (surgical E-code only)
- Non-surgical (diagnosis code and nonsurgical E-code)
- Non-surgical (non-surgical E-code only)
- Undetermined origin (diagnosis code only)

These figures show relatively stable percentages for these subgroups. Approximately half of all discharges with the diagnosis code for Accidental Punctures and Lacerations are of Undetermined Origin, that is, they include no E code.

Figure 2A: Accidental Cuts or Punctures
Utah Acute Care Hospital Inpatient Discharges, 1999,
Secondary Diagnoses

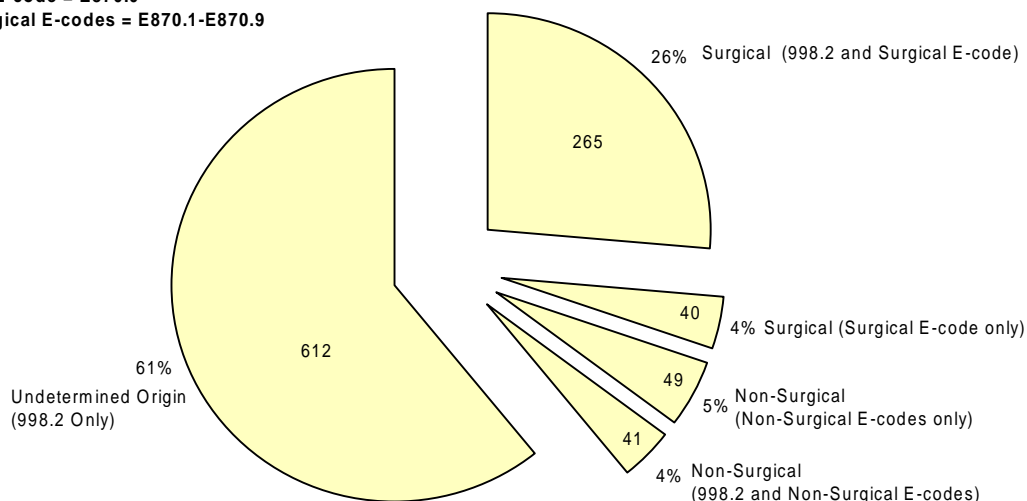
Total Accidental Cuts or Punctures = 918 (100%) (998.2 and/or E870.0-E870.9)
Diagnosis code = 998.2
Surgical E-code = E870.0
Non-Surgical E-codes = E870.1-E870.9



Source: Utah Hospital Inpatient Discharge Database, 2000, Utah Department of Health.

**Figure 2B: Accidental Cuts or Punctures
Utah Acute Care Hospital Inpatient Discharges, 2000,
Secondary Diagnoses**

Total Accidental Cuts or Punctures = 1,007 (100%) (998.2 and/or E870.0-E870.9)
 Diagnosis code = 998.2
 Surgical E-code = E870.0
 Non_Surgical E-codes = E870.1-E870.9

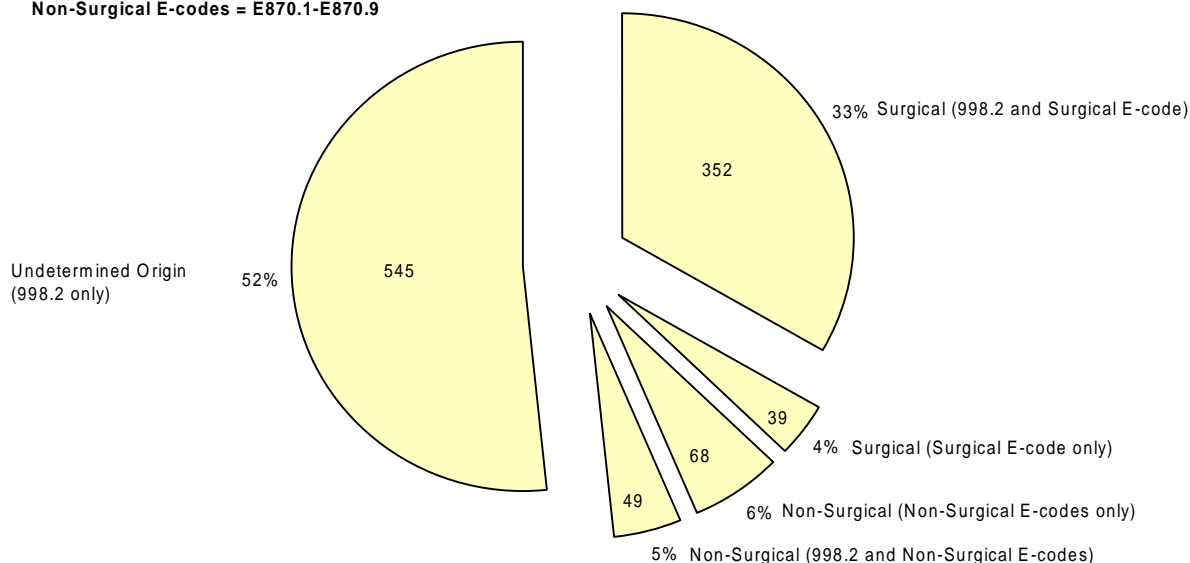


For figures 2A-2C (representing data from 1999-2001), the majority of accidental cuts and punctures (54% in 1999, 61% in 2000, 52% in 2001) are of undetermined origin - that is, the diagnosis code 998.2 was used without an E-code specifying whether the procedure was surgical or nonsurgical.

Of the remaining accidental cuts and punctures, the majority resulted from a surgical procedure (34% in 1999, 30% in 2000, 37% in 2001). A relatively small number (12% in 1999, 9% in 2000, 11% in 2001) were the result of a nonsurgical procedure.

**Figure 2C: Accidental Cuts or Punctures
Utah Acute Care Hospital Inpatient Discharges, 2001,
Secondary Diagnoses**

Total Accidental Cuts or Punctures = 1,053 (100%) (998.2 and/or E870.0-E870.9)
 Diagnosis code = 998.2
 Surgical E-code = E870.0
 Non-Surgical E-codes = E870.1-E870.9



Source: Utah Hospital Inpatient Discharge Database, 2000, Utah Department of Health.

Medication Safety Enhancement Strategies

An Update from *HealthInsight*

This year, the Utah/Missouri consortium study activities have included two exceptional professional development opportunities for Utah health care providers. On June 12th, in association with the Institute for Healthcare Improvement's 1st International Summit on Patient Safety, the study sponsored the participation of 48 persons representing 30 of 41 Utah acute care hospitals, the Utah Department of Health, the Utah Hospital Association, and HealthInsight in the IHI Minicourse on medication safety. The Minicourse used a "rapid-fire" presentation format, with a series of 15 brief presentations by nationally-recognized experts in patient safety management. Topics introduced included:

- Adverse drug event (ADE) surveillance - purpose, methods, and application (2 presentations)
- Hospital use of hazardous medications - standardizing, simplification, information management, and work re-design (4 presentations)
- Organizational risk management - briefings, event reporting, leadership involvement, and management of safety information (4 presentations)
- Patient health literacy (1 presentation).

Feedback from participants, gathered during the Minicourse and in follow-up conference calls, was very positive, with particular appreciation expressed for the practical nature of the materials presented.

This November, the study sponsored a development seminar in hospital medication safety that combined local and national perspectives. The seminar was held on November 13th in Salt Lake City and repeated on following day in Provo. Participants included 85 providers, representing 30 Utah acute care hospitals. The seminar featured two presentations by David Marx, JD, a consultant in human factors engineering. The first presentation addressed a key barrier to the design of safe patient care systems - the suppression of error, incident, and near-miss information because of the fear of a punitive response by potential reporters. It presented a "just" response as an alternative to both punitive and blame-free approaches. More information on the "Just Culture" can be found at: www.mers-tm.net. The second presentation introduced the application of a human factors engineering technique, probabilistic risk assessment, to improving medication system safety. Through the use of this technique, processes and practices key to reliable system performance can be identified and re-designed for safety. Other presentations included:

- Developments on the patient safety administrative rules and study updates from the Utah Department of Health.
- Preliminary results from the survey of organizational safety practices of Utah and Missouri hospitals
- ADE surveillance and detection methods
- Local providers adverse event detection and medication safety improvement efforts

While the seminar activities received generally positive evaluations from participants, the most enthusiastic ratings were reserved for presentations from local providers. We would like to thank the following for their contribution to the success of this seminar and for sharing their experience with their colleagues: Jennifer Hoffman, PharmD of the Salt Lake Veterans Administration Medical Center; Pete van Aarle, BS, RPh of Primary Children's Medical Center; Michelle Wheeler, PharmD of University Hospital and Brent Petersen, PharmD of Sanpete Valley Hospital.

Another seminar is planned for the spring of 2003. We will be seeking input on agenda topics and other arrangements over the next few months.

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UHA, Utah Hospitals and Health Systems Association

University of Utah, Department of Medical Informatics

LDS Hospital, Intermountain Health Care

Missouri Department of Health and Senior Services

Missouri Patient Care Review Foundation

University of Missouri – Columbia, School of Medicine

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For more copies of this update, please go to http://health.utah.gov/psi/pubs/psup_v1n2.pdf.

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